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UNITED STATES DEPARTMENT OF AGRICULTURE
✓ OFFICE OF INFORMATION
PRESS SERVICE

✓ Picture Story No. 25
November 18, 1946

USDA TILLAGE LABORATORY AIMS TO IMPROVE MACHINES, METHODS:

Man has tilled the soil for centuries. First with sticks and other primitive tools. Then with metal plows. Today with machines mounted on and powered by tractors. But the exact effects on the soil of tillage tools--the plow, the disk, the harrow--still are debatable.

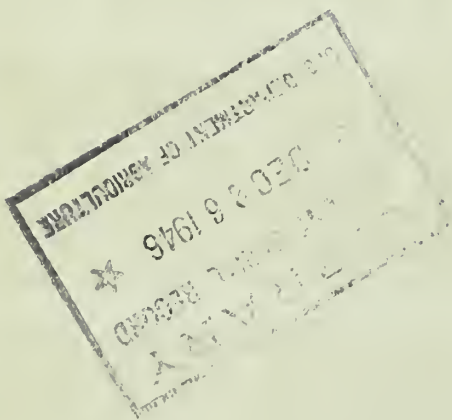
Farmers, agricultural scientists, and farm machinery manufacturers would like answers to the following questions: How do different plow designs affect different types of soil? How do different methods of tillage affect the soil? What is the minimum in tillage for the greatest plant growth? What changes in soil tilth are caused by moisture and other natural factors? What effects do tool design, speed of operation, and soil conditions have on power requirements? How can tillage tools be improved? What new tillage tools will help the farmer do a better job? How should these tools be designed?

Finding the answers to such questions is the aim of the research carried on by agricultural engineers at the Tillage Machinery Laboratory of the U. S. Department of Agriculture at Auburn, Ala. This laboratory is probably the only one of its kind in the world. Here, working with crops and soils scientists and State experiment stations, the engineers study tillage tools under controlled conditions. Ten representative soils of the South, varying from the light sandy type to heavy clay, in 250 by 20-foot bins filled to a depth of 2 feet, are used for this basic research on the effects of tillage on the soil, involving both the design and operation of tillage tools.

Around 3,500 plow and disk tests have been made at the laboratory, with tools of different sizes and shapes, operated at a wide range of speeds under various soil conditions, to determine the effects of the tools on the soil and of the soil on operation of the tools. The results of these tests point the way to improved tillage techniques, as well as to design of more efficient tools by industry. Under cooperative arrangements, manufacturers are free to use the laboratory's facilities in making performance tests on tools of their own design.

Aside from its tillage tool research, the Auburn laboratory also studies methods for producing, harvesting, and handling various crops, particularly those grown in the Southeast. Special equipment developed as a result of this research includes a peanut digger-shaker, a peanut sheller, a portable tung nut decorticator, and a castor bean huller. The designs for these machines have been made available to industry for possible large-scale production.

These pictures show some of the equipment and results of research at the Tillage Machinery Laboratory.



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